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FACTORS COMMON TO THE MIND AND TO THE EXTERNAL WORLD

EVER since Parmenides wrote the greatest of philosophical poems, philosophers have been impressed with the difference between the world as known by "Truth's unwavering heart," that is by reason, and the world, as known by the "notions of mortals," that is, by perception.

So impressed have philosophers been at the striking difference that exists between the psychologist's world of sensations, images, and feelings and the physicist's world of mass, motion, and electricity that many have asserted that the world seen and the world as seen have nothing in common.

The purpose of this paper is to show experimentally that when proper account is taken of what is actually perceived, this supposed difference between an objective and subjective account of the world very largely disappears.

Specifically, it is planned to compare two accounts of the object of experience, the first, the introspective report of his conscious content, made under experimental conditions by a trained observer; the second, a description by a trained physical scientist of the object which the observer was perceiving.

This comparison of reports will be made objectively, very much in the spirit that one would compare the texts of two different versions of a Platonic dialogue.

This method has some obvious advantages over a more profound metaphysical approach to the problem of mind and matter. In the first place, it makes possible a sharp delimitation of the problem. In the second place, this objective method has the very great advantage of being clear in its postulates and assumptions.

On the other hand this objective method has equally important disadvantages. It is essentially the method of science; hence, the results are those of science; hence, they can be applied to metaphysics only as far as the results of science can be applied to metaphysics, and that, according to some, is not at all. Nevertheless, it is hoped to arrive at a general position which will be somewhat startling and novel, and which probably has important philosophical connotations.

The introspective account is this:

I saw a black field of unlimited extent. In the center of this field was a hexagonal patch of yellow composed of three rhombohedral patches of yellow, but each of different brightness. The one on the upper right was the brightest.

The scientist's account of the situation was this:

The observer was looking with one eye at a cube painted with barium chromate. The cube was suspended in a totally dark room by an invisible thread. One corner of the cube was directed towards the observer. The only illumination on the cube was from a flashlight, set to shine on the cube from the upper right. There were no other reflecting objects in the line of sight of the observer.

Apparently the introspective account and the scientific description have but little in common. But let us look into the situation a little bit further. Was the real physical object which the observer saw a cube in space? It was not. This can be proven experimentally.

If one will make a colored photographic transparency of the correct size of the cube and stick it upside down and wrong side out on one of the new type of glasses which are applied directly to the eyeball, and if one will illuminate the eye from a point source of light, one will form on the retina of the eye a shadow image, which will be identical with the focused image formed by directing the eye towards the cube. Now there is very little that is like between a cube and a photograph, yet what is seen will seem to the observer to be the same. Hence one may conclude that the observer really saw, not the cube outside, but the retinal image or something between the retinal image and the brain.

Let us assume he sees the retinal image. The retinal image is a physical thing in the same sense that a photographic image is a physical thing. Since it is a physical thing, it can be described by a scientist.

The following is such a description:

The observer had no light at all points of his retina. In the center of the retina was a hexagonal patch illuminated with light reflected from barium chromate, composed of three rhombohedral patches, illuminated with light reflected from barium chromate, each of different intensity. The one on the lower left was the most intense.

If one now compares this scientific description of the retinal image with the observer's account of what he sees, one will find many more points of similarity. The points of similarity and difference of the two accounts can best be shown by writing the two accounts the one under the other.

I	saw	a black	unlimited	field.
The observer	had	no light	at all points	of his retina.

In the center of the	field	was a hexagonal patch	of yellow illuminated with light reflected from barium chromate
In the center of the	retina	was a hexagonal patch	

composed of three rhombohedral patches		of yellow illuminated with light reflected from barium chromate	each of different
composed of three rhombohedral patches			each of different

brightness.	The one on the	upper right	was the	brightest.
intensity.	The one on the	lower left	was the	most intense.

It is to be noted that the two accounts have a kind of one-to-one correspondence. Many of the words used by the scientist to describe the retinal image are the same as the words used in the introspective accounts, and the two accounts can be put in the same order.

It is to be noted also that most of the differences which occur in the two accounts are in what the logician would call the "terms." Thus the observer said, "I"; the scientists, "the observer." The observer said "black"; the scientist, "no light." The observer said, "field"; the scientist, "retina."

The similarities are mostly in relations or in qualities which are clearly relational. The two accounts agree that the bright image was "in the center," was "composed of three rhombohedral patches," etc. But this distinction is to some extent arbitrary for some relations, e.g., "saw" and "had" are different in the two accounts and some terms, e.g., "patches" are the same. Nevertheless it is highly significant that many of the words which the observer used to describe the relations which held between the elements of his conscious content were exactly the same words which the scientist used to describe the relations which held between the elements of the retinal image.

The objective method which has been used here allows one to say in an objective spirit merely that in some cases the relations between percepts and between things can be described in the same words. But as a philosopher, I know no reason to be so meticulous. For there seems to be no valid epistemological or ontological reason why one should not conclude from these experiments that in the ontological sense the relation described as "in the center of" was exactly the same relation, whether holding for the retinal image

or the psychic image, and if this is so, we have, even at this early stage of our inquiry, found at least one thing that may be common to the world of the mind and the world of thing, namely, certain relations.

However, this is in anticipation. We have traced the "thing" we see from the cube outside to a retinal image. But does the observer really see the retinal image? He does not. What he sees is a nerve impulse group somewhere in the brain, presumably at the point in the occipital region where the impulses coursing along the optic track pass from one neurone set to another.

This has long been realized since on no other assumption is it possible to explain visual images in dreams, hypnosis, etc. But for our purposes this general assumption is not enough; we want to be able to describe the nerve impulse front which is the actual object of vision quantitatively and exactly so that a comparison can be made between the account of the brain state in a typical case of vision and our introspective account of that case of vision.

Unfortunately in the case of chromatic or daylight vision the physiological theories have not been developed to the point where the scientist is able to describe with any certainty the brain state which is consequent to a given retinal stimulus.

Only in the case of twilight vision is it possible to calculate exactly the relative intensity of nerve impulses at all points in the impulse front and thus make possible a direct comparison of the physiologist's account of the brain state really seen and the observer's subjective account of what he sees. Consider now what happens to the appearance of our cube as one decreases the illumination. As the light reaches a certain critical low intensity, the mental image which has been slowly getting less bright (and developing an olive shade) abruptly becomes less sharp, and the cube no longer looks yellow but gray. It also looks less bright in comparison with a green object. In ordinary vision a yellow object looks lighter than a green object. In twilight vision, as the present state is called, a green object looks brighter than a yellow one.

The physiologist accounts for these differences as follows: There are two sets of receptors in the normal eye, the rods and cones. The cones are responsible for color vision, the rods for twilight vision. Below a certain light intensity, the cones cease to function, e.g., there is not enough chemical stimulus by the light to cause nerve activity. Hence when the light intensity falls below a certain value, only the rods react. The rods contain a colored substance, visual purple, which is bleached by light to produce a new substance, related to Vitamin A. This substance, when its rate

of production is high enough, acts as a chemical stimulus to the nerve fibers, thus producing nerve impulses. The energy density, or intensity of these nerve impulses, is proportional to the rate of production of this substance, and hence is proportional to the rate of bleaching of the visual purple. Ordinary photochemical equations apply to the rate of production and destruction of visual purple. Since this is so, the intensity of the nerve impulses reaching the brain over the separate fibers of the optic nerve can be calculated for the case of twilight vision, if one knows the intensity and wave length of the light falling on the retina. The equations for this are due to Selig Hecht.

The important thing for us about these equations is the fact that when the observed apparent relative intensity of the light as seen by introspection is compared with the relative intensity of the nerve impulse, calculated for the various conditions that Hecht's equations make possible, there is exact agreement.

Strictly Hecht's theory is restricted to the nerve density over a single fiber and to the brightness at a single point in the introspective field.

Let us further suppose, and there is some anatomical evidence for this view, that nerve impulses from rods which lie side by side in the retina go to regions in the brain which lie side by side. This simple fact assures us that the impulses originating simultaneously from any set of points in one-half the retina go to a set of points in the brain which are arranged in the same order. Thus impulses which originate from three points which lie in linear order on the retina arrive simultaneously at points on the brain which are also in linear order.

Only one further fact is needed to complete the description of the brain state during twilight vision as a function of the arrangement and intensity of the illumination on the retina. This is the observation that since the individual fibers of the optic nerve are alike, Hecht's equations should apply to each and that all the various impulses leaving the retina at a given instant of time will arrive at the brain at times which are very close together. The points where these impulses are in the brain at a given instant thus define a surface. We will agree to call this surface the "surface of impulse."

With these factual assumptions the scientist may now describe the state of this surface of impulse as the observer is looking at the yellow cube under conditions of low intensity. This is his account:

> The impulse surface of the right eye has nerve impulses of density 1 at all points except in the middle. Here the nerve intensity abruptly increases. The

shape of the area where this abrupt increase takes place is hexagonal. In this hexagon are three rhombohedral areas meeting in a common center and arranged cyclically in the order of intensity, 4, 5, 7.

Compare now an actual introspective account made with a trained observer who was looking with one eye at the yellow cube, and who was allowed to look when he desired with the other eye at a standard scale of intensity marked 0 at dead blackness and 10 at pure white. This arrangement was made to allow him to make numerical estimates of grayness with some accuracy. The illumination was such that both eyes were twilight adapted.

The introspection follows:

The field of vision of the right eye has an intensity of light of 1 at all points except in the middle. Here the intensity of the light abruptly increases. The shape of the area where this abrupt increase takes place is hexagonal. In this hexagonal are three rhombohedral areas meeting in a common center and arranged cyclically in the order, 3, 5, 7.

Note now the two accounts: They are exactly the same except the scientist said "surface of impulse" where the observer said "field of vision," and the scientist said "density of impulse" where the observer said "intensity of light." There is also a slight discrepancy in the numerical estimate of intensity. The scientist calculated from Hecht's theory and from certain photometric measurements of the light reflected from the cube a relative density of impulse of 1, 4, 5, 7. The observer found by comparing the intensities of the cube with that of the scale 1, 3, 5, 7. This is well within the ability of the observer to discriminate shades, or the ability of the scientist to make the necessary physical measurement. Except for these matters the two accounts are identical word for word.

In particular all the relations between the elements are described in the same words in both accounts and therefore presumably identical. These relations include shape, position in field, relative intensity. Altogether about twenty can be recognized. If we take the words literally and suppose the scientist and the observer meant the same thing when they used the same words, the only difference in the two situations is that a "field" in the mind is used in place of "impulse" in the brain, while "density of impulse" in the brain is used for "intensity of light" in the mind.

Now the method of this paper is not competent to decide whether these three physical things, surface, impulse, and density are the same as the three mental things, field, light, and intensity. In strict logic that decision belongs to metaphysics.

But science can add the observations that as far as objective evidence can decide, all of the relations in which these terms enter,

in brain or mind, are respectively the same. Since there is nothing especial about the perceptual situation studied, it is believed that in all introspections of the image formed in the eye in twilight vision, the introspective account will be identical with a scientist's of the brain except for the change of the words, light for impulse, intensity for density, and field for surface, and in particular, it is believed that all the relations found by introspection between its entities will exist likewise in the brain between impulse groupings.

Now the usage of words in any language is fixed by the relations in which these words enter with other words. We can always substitute for any word, another word, provided the new word can always stand in the same relation to other words of the language as the old word did.

My daughter when she was little called a dress a "lala." We knew that "lala" meant dress because everytime she used the word "lala," it stood in the same relation to other words of her vocabulary as dress should have.

Now suppose my daughter had been brought up in the twilight and had been taught what we call a light, an impulse, and what we call brightness, intensity.

In what way under heaven could we distinguish her account of her introspective experience when she saw a yellow cube in the twilight from the scientist's account?

All this has been limited to vision and to vision under conditions where everyone is color blind. It would be entirely improper to generalize these conclusions to normal color vision, or to other senses without further evidence. In order to generalize safely that all perceptual qualities were merely names for brain states, one would need to prove that the qualities, yellowness, redness, hotness, coldness, sound, and the rest, can by introspection be analyzed into some common factor. It is believed this is true but it can not as yet be proven.

One thing, however, I can ask you to believe, for it requires for proof merely the repetition for the other senses separately, what has been done for sight, and does not require the strange assumption that there are like qualities in a sound heard and a sight seen.

This generalization, I ask you to believe, may be called the first law of psychophysiology. It is:

If in introspection, relations are found between conscious content and these relations are of the kind that can exist between nerve impulse groups, then these relations do exist between nerve impulse groups, and conversely, if relations exist between nerve impulse groups, these relations may exist between conscious content.

This law is of practical scientific interest for it gives a method

of deducing physiological facts from introspection. Indeed it is the law on which all psychophysiological theories must necessarily be founded.

It also is of philosophical interest, for it is the first definite statement of a monistic theory which actually *identifies* in a specific way, part, at least, of the conscious content with part of the neural state.

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INQUIRY AND DISCOURSE [1]

I

THERE is no identity between logical and existential forms but it may be said that logic corresponds to existence as a technique whereby problematic existential situations are transformed into objects of systematic knowledge. This is the position of Dewey who believes that logic is concerned with the forms of inquiry, where inquiry is understood not as scheming, but as experimentation which forces existence into the manifestation of form, and which, therefore, although conceptually controlled, is an existential procedure.

"Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole." [2]

"Logical forms accrue to subject-matter when the latter is subjected to controlled inquiry." [3]

This identifies logic with scientific methodology, and means that the principles of logic are the basic or pervasive methods of science,

[1] Read at the joint meeting of the Eastern and Western Divisions of the American Philosophical Association, Columbia University, December, 1939.

[2] Cf. John Dewey, *Logic. The Theory of Inquiry*, 1938, pp. 104–105. The importance of this book is in its influential appeal to restore to logic its position in philosophy. Dewey makes a distinction, somewhat similar to my distinction between formal logic and the theory of logic, between the proximate subject-matter of logic, which is the domain of the relations of propositions to one another, and its ultimate subject-matter, which includes questions about the status of logical forms, on the ground of which "logic is a branch of philosophic theory."

[3] *Ibid.*, p. 101. Ch. XIX gives a detailed explanation of the sense in which logic as a set of procedural means must correspond to existence as materials for transformation. Technical processes "must be such as to be capable of just those modes of application that are suited to the materials with which they deal." Also, "Any technique or set of procedural means must satisfy certain conditions of order so that it possesses *formal* properties."

methods which one does not question because past experience has proved them to be dependable regardless of the field of inquiry. In other words, logical principles are procedural means of successful inquiry. "Stated in terms of the means-consequence relation, they are a generalization of the nature of the means that must be employed if assertibility is to be attained as an end."[4]

There could be no serious objection against Dewey's use of the word "logic" as a synonym for "methodology," if there were not conceptual forms of technical *discourse* which have an entirely different function from the methods of inquiry. Dewey, being unwilling to recognize these different functions, makes allowance for discourse only *within* the procedure of inquiry. In a problem which suggests its own solution, after the latter is formulated in a proposition, there comes a phase of inquiry in which the meaning of the proposition is developed by eliciting its consequences, to be checked later through observation or experiment. This phase, which is adequately expressed in a series of "If-then" propositions, is what Dewey means by discourse. From his point of view discourse is not independent of existential procedural operations, and the "end-in-view" of the latter determines the direction and, thereby, the content of the former; the "If-then" propositions, however abstract they appear to be, are concerned with existence or with "forms-of-matter" because they are the rules and methods of experimental observation.

> The case of ordered discourse in which all propositions are, as such, non-existential in import, and which form a series in virtue of the implicatory, as distinct from the inferential, function affords at best but a seeming exception to the principle that forms are forms-of-matter. For the sequential order of any such series is determined in all cases, in which the final proposition has applicability, by material conditions. Theoretically or in the abstract, an indefinite variety of series of implicatory propositions is possible—as in mathmatics. But—as appears in mathematical *physics*—mathematical implicatory series, in all instances in which applicability enters as a condition, have their contents and their order (in determining a final hypothetical proposition) controlled by the observed existential conditions that form the problem requiring a generalized solution. Otherwise, contents would be taken and ordered in such an indeterminate way that even if the order were necessary with respect to rigor of implication, there would be no assurance whatever of any kind of final applicability. We are again forced to the conclusion that formal relations state conditions to be materially satisfied.[5]

Thus summed up Dewey's position is obviously vulnerable. One might point out that the relative independence of other phases of inquiry which Dewey grants to discourse, especially mathematics, is really treating the forms of discourse as separate from the

[4] *Ibid.*, p. 16.
[5] *Ibid.*, p. 381 f.

methods of empirical science, and, therefore, identifying them with logic. When Dewey protests that a separate treatment would deprive discourse of a determinate direction towards final applicability, the answer is that discourse has often been developed for its own sake, with no regard or even hope for final applicability. Thus, to turn one of his own favorite illustrations against Dewey, non-Euclidean geometries were worked out at the time when no one could suspect that they would ever find application to mathematical physics. But these objections, although correct as far as they go, do not go far enough because they do not challenge Dewey's definition of discourse. This failure conceals that essential opposition of inquiry to discourse which is the difference between the orders of discovery and of demonstrative exposition. It is one thing to arrive at a founded conclusion, and another to present and justify it in communication with others. The grounds for making a conclusion may give the investigator complete satisfaction, and yet require an entirely new context of formal derivation to be accepted by the reader. Obviously neither Leibniz nor Newton discovered the calculus along the same trim lines that are familiar to the students of modern textbooks. But even if, from a broader point of view, we can consider both the procedures of an original mathematical thinker and of a student to be different methods of inquiry adapted to different stages of advancement, we should be able to contrast the forms of procedural mathematics as inquiry with the forms of its rigorous systematic exposition as it is found, for example, in the *Principia Mathematica*. Procedurally the *Principia* is worthless, no practicing mathematician ever goes at his problems and calculations by using the forms or the notation of symbolic logic; yet, as an attempt to demonstrate that mathematics can be derived from a few primitive propositions in accordance with a few rules of deduction, the work of Whitehead and Russell, even though not flawless, is recognized as epoch-making. The distinction between discourse and inquiry as exemplified by the contrast of the procedure of the *Principia* with the familiar constructive approaches to mathematics can be also found in other fields of knowledge and experience although in practice exposition and constructive thought or research may intermingle to the extent of becoming inseparable. Sometimes the purpose of communication and justification of the results of a previous inquiry can be served satisfactorily by a mere report of the various phases of the inquiry in their chronological order, either because it would be pedantic to look for a rigorous formal derivation or because, as an exception, the order of existential discovery coincides with the order of logical proof. Disregarding exceptions and leaving out mixed

forms which are found in practice, one can establish an analytic differentiation between the logical forms of discourse and the scientific methods of inquiry both in a general outline and with regard to specific characteristics.

Discourse is the communication of results which have been obtained through inquiry. While inquiry is throughout stamped with the individuality of the existential situation which gave birth to the problem as well as with the peculiarities of the imaginative and scholarly resources of the exploiting mind, the exposition of the results must be objectively communicable and, therefore, carried out in general terms that can be understood by a mind with the prerequisite cultural training. Discourse is not merely a communication of the results of previous inquiries but, when the communication consists of premises from which these results are derived as valid conclusions, a logical argument. The conditions and forms of such valid derivations make up the subject-matter of formal logic. Since the function of derivation in discourse is obviously different from the function of obtaining results in experimental and constructive thought, any attempt to identify the forms of logic with the patterns of inquiry must inevitably break down. It has always been known that logic gives cannons of *demonstration,* while empirical sciences can only boast of *problematic knowledge.* Disregarding this distinction leads to the misunderstanding of such basic elements of discourse as logical principles, propositions, and generality.

II

Logical principles, as Dewey understands them, are generalizations upon the ways which have always led to success in inquiry. Against this view stands the usual criticism that a naturalist position, while compatible with the contingent truth of empirical propositions, can not do justice to logical or mathematical necessity, and it is noteworthy that people who are ignorant of science and its technique can nevertheless easily understand the incontrovertible force of the principle of non-contradiction and others. Even more decisive is the fact that adherence to logical principles is sometimes an impediment to a successful inquiry, and, on the other hand, successful procedural means often fail from the point of view of rigorous logic. Thus in the process of constructive research the investigator may come to conclusions which force him to abandon the initial assertions, for insistence upon remaining consistent with the latter would cut short the inquiry.[6] Even worse, the scientist

[6] Cf. Dewey himself, on page 311: "In an inquiry of any high degree of difficulty many propositions are entertained during its course only to be dis-

can hold at the same time contradictory statements if the rejection of either of them would cut off important fields of experimentation, as happens in the Quantum Theory where one must treat an electron both as a particle and as a wave. It may be, however, that a discrepancy of this kind between logic and methodology arises only in a theoretical exposition of the scientist's experimental work, which would mean that there is a more profound difference underneath, a difference of languages not translatable into one another, that falsifies the procedures of inquiry when they are exposed in discourse. Be this as it may, there is no doubt that the elements of discourse, the propositions, are different from the meanings which grow together in inquiry.

The truth is that what Dewey calls "proposition" is not at all what this term stands for in logic. As a technical term of logic a proposition is an invariable public meaning (of an indicative sentence), which can be dissociated from a larger context or transposed from one context into another without any loss or alteration. To Dewey, on the contrary, a "proposition" is a contextual entity, which grows and changes with the advance of the inquiry. Strictly speaking, Dewey's "propositions" if confined to the sentences which introduce them, are incomplete; they are meanings which intermingle with one another and thus spread over the whole of the inquiry; unlike the propositions of logic, these meanings are not isolatable units of thought. To quote Dewey's own words:

> According to the position developed in this book, the "simple" propositions, with which other propositions are contrasted as "compound," are logically incomplete, being instituted only for the sake of arriving at the complete propositions which are called compound.[7]

I should not be surprised if the meanings in a process of inquiry were, as Dewey says, intermediate and contextual, but I question his use of the term "proposition" as an exclusive or even appropriate name for such functional meanings. But in order to defend the technical logical use, I wish to qualify the immutability of logical meanings by indicating the restricted sense in which even propositions of discourse can be said to be contextual. First, there is increment in meaning and import to the sentences as the

carded or modified in subsequent inquiry." This follows a sentence which indicates that sometimes Dewey "lapses" into a realization that the logical order is distinct from the actual order of inquiry: "The following discussion is concerned . . . with the logical order of propositions . . . in carrying on a given inquiry."

[7] *Ibid.*, p. 336 n., cf. also pp. 287, 311, 342, and 345. In contrasting his doctrine with "the theories, traditional or contemporary, which isolate propositions from their contextual position," Dewey calls propositions "intermediate and functional."

argument progresses; the same sentence which meant very little to the reader at the beginning may acquire a rich content at the end of the reading. For example, the statement that "Logic is concerned with the formal properties of propositions," even if understood by a beginner, does not have the informative value which it acquires at the completion of a course in logic. Speaking loosely there is change in the meaning of the sentence; yet this admission is not to be taken in the sense that the same proposition can undergo alterations. "Meaning changes" is, in this connection, more exactly formulated as "In discourse a meaning (or a proposition) associated with a sentence can be replaced by another." The replaced proposition does not change itself, it is merely superseded; furthermore, replacement of propositions in the development of a valid argument is never a discarding—the original proposition remains incorporated in the content of its successor. Thus preserved, the original meaning can be taken as *the* meaning of the corresponding sentence, since the successive accumulation of import does not condition the understanding either of the sentence in its first occurrence or of the transition to the next sentence in discourse—the accumulation is entirely due to the contribution of the successor-sentences. Of course, even in its first occurrence a sentence can not be understood except in the context of information which a qualified reader is supposed to have. But the amount of such information varies from one discourse to another, and in a purely postulational system can be freed from any factual or empirical elements. This is possible because the propositions of discourse are general and their generality is a way of referring to existence without a specification of, and, therefore, without dependence upon, particular existential data.

Dewey overlooks this office of generality in discourse, and this oversight, together with his own peculiar definition of generality in inquiry as a mode of operation, leads him to a complete misinterpretation of the theory of general propositions in formal logic. Dewey accuses logicians of taking the "all-sentences," i.e., sentences of the forms "All S is P," to be formulations of what he calls "universal propositions," and of failing to observe that the same sentences often express an entirely different kind of "generic propositions." His example of a "universal proposition" is "All men are mortal" interpreted as "If anything is human, *then* it is mortal," i.e., taken in intension, as a necessary connection of "humanity" with "mortality." The same sentence "All men are mortal" illustrates a "generic proposition" when interpreted as "All men have died or will die," which, Dewey says, is a spatio-temporal proposition with an explicit existential import. He then

adds that the "fallacy" of treating the "all-sentences" as "universal propositions" resides in "identification of absence of reference to *specified* individuals or singulars with absence of reference to singulars as such."[8]

Of course, Dewey is wrong, because the "all-sentences" in formal logic are not taken in intension. It would be closer to truth to say that they are treated as "generic propositions," although they also cover "universal propositions" in Dewey's formulation, which is inadequate as an expression of propositions in intension. Thus "If anything is human, then it is mortal" is accepted in formal logic as an interpretation of "All men are mortal" but only because it is not equivalent to the intensional "Humanity implies mortality," since, as the words "anything" indicate, it has a *general* reference to things or to existence. It is true that a proposition such as "All men are mortal" is called *non-existential.* But this characterization merely indicates the fact that "All men are mortal" is the contradictory of a proposition with an existential prefix, viz., of "There are immortal men." And whether a particular type of existence such as "human immortality" is affirmed or denied, that is, whether the general proposition is existential or non-existential, there is a reference to existence. As the analysis of general propositions shows, they presuppose a basic distinction between the context of description and the order of existence and they establish a relationship between the two by asserting that a certain description, for example, "human immortality," either is or is not realized. Not only have logicians never denied that general propositions contain reference to existence or "to singulars as such" in the absence of reference to a specified singular, but some writers, as is well known, even tried to interpret the "all-sentences" as conjunctions and the "same-sentences" as disjunctions of singular propositions. Of course, to explain away generality is not satisfactory as an explanation, but it serves to emphasize existential reference. The true purpose of generalizations, however, is to enable one to refer to existence independently of any knowledge of its constitution or inventory. When an abstract postulate begins with the phrase "There exists an x such that . . . ," the nature of the existence referred to need not be known except in connection with an interpretation, and, with different interpretations, the nature may also be different. If the phrase is expanded into "For any y and z, there exists an x such that . . . ," and if the interpretation would place x *between* y and z, the correlated existence even ceases to consist of actual presentations, and becomes rather a *disposition* for such. For ex-

[8] *Ibid.*, p. 257.

ample, in an interpretation in terms of the linear order of points one does not mean to say that, given any two points on a line, there actually is a third between them, but that the third point *can* be realized by insertion. Thus generality gives allowance for transition from the existential level of inquiry to the level of abstract discourse with the possibility of returning by way of specification of the nature of existence subject to reference.

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CAUSATION, ACTION, AND CREATION

THE study of causation comprehends an investigation of the logical problem: what is causation, of the psychological problem as to the genesis of causation: where does the concept come from, and of the ontological problem as to the "objective" value of causal connection: does it "hold" in reality? The causal nexus seems an almost unique sort of connection, an almost mysterious relationship. Has this "relationship" any "simulacrum" at its bottom, some conscious or unconscious prototype? Is it succession, perhaps a special sort of "succession," or none at all? We feel however that it means "more" than succession, that mere succession and causality are not interchangeable. But one thing seems to dawn upon us that whenever we say "cause" we think of some "genesis" of things, of a genetic relation as if the idea of "origin" or the symbol of origin would lie at the bottom of the idea of causality.

Language offers some hints. We say that the cause "produces" effects. The term "producing" should be stressed. It is rendered in German by the term "*erzeugen*" which has a sexual connotation. (Something is being "born.") But when we say "producing" we have always in mind a "producer," an "outside force," a living power which is apt to "produce" the change. We never "see" this force, we infer it. For instance: a pot of water stands on a gas stove. I turn the cock (first action), gas leaks out (effect), I light the gas (second action), the fire flames (effect), the water boils (effect of a previous agent "fire"). I infer that the water boils "because" of the heating force of fire, but I don't see the "because," this specific link termed "because"; I suppose so, I supply this link and in doing so I really invest the fire with a mysterious force; I consider the fire as a mystic power which is apt to make the water boil. What I am doing is really this: I invest the fire with the same power of action which I possess myself when I am "doing" something, pushing an armchair, for instance.

The fire is just such a living agent as I am myself in every kind of action; in other words, this causal conception of the fire making the water boil is a projection of my own human personality on the fire or for that matter on everything conceived as a "cause" of some "change." We may equally assume that there is a "simile," an analogy, involved in this mental process, my human personality and the fire being the two objects of the simile.

If I say that a body "falls," "because" it is heavy, I imply that heaviness or weight is a force apt to make the body fall. In other words I make a "personification" of that mysterious heaviness; the phrase would lose the specific flavor of "causal compulsion" if it were conceived otherwise. It would merely signify a circumlocution (in form of a causal clause) of a simple classification, meaning: all heavy bodies fall, this is a heavy body too, so it falls as they all do (a single example of an allegedly general behavior of bodies). If I say (as a physicist) that bodies fall "because" they are attracted, I conceive "attraction" as an "acting agent," or as a hidden "goddess," as something human, a "producing" force, a paternal force. This is a "spiritual" conception investing the Earth with a power or a mystic "*agens*" producing effects or "changes." It is an animistic conception, brought about by projection of our own nature on "objects." All this presupposes implicitly the conception of the universe as a conglomerate of acting powers or producing forces, which "give birth" to effects. The conception of cause may thus be described as the most general and ultimate form of panpsychism due to an act of projection.

During a night when all was quiet and the room darkened, I heard suddenly a mysterious sound from within the locked up piano. I asked myself in awe: "Who" gave that sound? I looked for the "agent" who produced the sound. In so doing I thought "causally." I "understood" that somebody or something must have "caused" the sound. Being naturally "superstitious" I assumed at first that it was somebody, not something. A naturally superstitious being thinks just as causally as a scientific being, but it seeks the "causes" rather in "somebodies" instead of "somethings." The scientist "neutralizes" the "spirit" or the "ghost" without changing the substance of the matter. In the history of thinking we seek first the "somebodies" and afterwards the "somethings." But even neutralized this something remains the "author" (*auctor*), a "doer" and a "spirit." To be superstitious means only conceiving events as acts and interpreting things as results of some hidden actions.

Whoever expects "results" as a sequence of his actions, thinks causally. A primitive man raising his club to hit his opponent

thinks "causally," inferring that striking with the club will produce certain effects desired.

All transitive verbs imply causation, they imply "doing" something, which "doing" always means causation, producing of effects. All transitive verbs are "causal predicates." As for the nontransitive verbs, their meaning is patterned after the model of the transitives, i.e., there is a "doing" perceptible in their meaning. "I sleep" implies a hidden but easily perceptible connotation "I do the sleeping"; there is something "active" in that verb. Thus "sleeping" is conceived as an enduring action. "The stream flows" is conceived in an analogous way, as if the stream (a mystical "stream") would do the flowing. The stream is equally conceived as a being engaged in a performance. Even the intransitive verbs imply causation.

Causation forms the pattern after which a living being conceives changes in the world which is seen as a system of "acts." Whatever happens is visualized as act of a living agent or author, as a doing. The very nature of the verb proves it, the verb meaning always action. And changes or happenings are always expressed in the form of verbs. All events (or "changes," which means the same) are conceived as a system of actions deriving from authors. Authorships and creations make up the human universe. That system has left a "sediment" in speech, namely, the "verb" which always means "action."

Cause points always to some "genesis" and everything is conceived as an act of "creation," as an "issue" of some "father," a maker. The pernicious microbes which "cause" the pulmonary ailment are the "parents" of a malicious "child," namely, the "ailment." Thus the idea of birth is superimposed on the idea of action as a second sheath of meaning. This is the second mental projection in the "causal" system. Parenthood, just as action (or perhaps better "acthood"), is the prototype of causation. That action which is expressed by the relationship of parent and child (parenthood and childhood) is one instance of action, but it is its most striking example, the foremost example of "authorship." But not only that action, every action is conceived as such an act of creation. There is always an "author" and the "work."

It has been stressed that the characteristics of "certainty" and "universality" (*Notwendigkeit und Allgemeinheit*) encompass causality, which means that we must conceive changes causally and are unable to conceive them otherwise. I think that a tautology hidden at the bottom of the causal system will explain the mental fact of these characteristics. It consists in the fact that if we say "action," the seemingly "successive" result of action, namely,

the "effecting," is identical with the action itself; they are both only two facets of the same identical "act." By action I mean acting something or "doing something"; and if I do something I effect something. There must be the counterpart to the doing, the engramma on the "matrix," since action means leaving engrammata on the matrix and nothing else (*"passio"* is the counterpart of every *"actio"*). The material of the cosmos carries like a matrix the "engrammata" of action but every single "move" is at the same time action and reaction or causing and effecting. The real meaning of the causal system would be that there is no act without acting and no product without producing. In other words, there is no real succession at all implied in the concept of causation; the latter means acting which in turn means doing the act or producing the product. It is actually simultaneous, as I have explained.

When we split (mentally) the phenomena into causes and effects, we dissolve the world into an anthropomorphic system of actions or into subjects doing things. This twisting or splitting is expressed by the grammatical fact "sentence." The splitting of phenomena into causes and effects, the conceiving of the world as consisting of subjects doing things (objects) is merely an animistic pattern, the verb itself is the abode and refuge of causation since the meaning "doing" vibrates always in its innermost core.

An "observer" of the empirical world will say that whenever a change occurs, somebody or something "makes" the change, namely, the one who is its author, in other words, the changing factor. But why do we imply such a changing factor? What does "change" really mean? Is that "somebody" who makes the change the "subject," or better, a subject, perhaps implied in the very concept of change? Not directly but by implication, for the following reasons: Thinking does not act by means of isolated detached "concepts" or notions; it proceeds dynamically by means of statements (sentences in grammar) (*Urteile*). "Change" (in its animistic transcript; action) is the most general pattern or framework within which the meaning of all transitive verbs may be placed, since every such verb means some change. But this is only a predicate and such predicate presupposes within the machinery of thinking always some subject, the verb itself having no proper existence of its own; it may claim an existence only within the framework of a statement or sentence (*Urteil und Satz*). In other words the seeking for a "cause" would mean the seeking for a subject of a given statement or sentence, the latter being the general pattern of thinking. Since every fully-developed statement calls for a subject and would be incomplete, nay, senseless without

one, we always ask for the subject whenever we are confronted by the mere verb. Likewise we ask about the "cause" whenever we are faced by a "change," since cause and subject are identical. Since every verb implies causation and every statement presupposes a subject, we must seek the "cause." We could think non-causally only if we could think in non-statements (or non-sentences) or in sentences without subjects, which is impossible. The secret of the particular structure of causation is hidden in this very structure of the statement, this "vehicle" of our thinking which has a causal construction (whenever it states changes). Being always composed of a subject and a verb (in this instance), we must infer a subject and "ask" about it, if we are faced by a verb. The ever-haunting query about causes is thus revealed as the question about the "subject" whenever the "verb" is given. It is the "longing" for the completion of the "truncated" incomplete statement. Even in such sentences as "it thunders," the "it," though it is not a Jupiter, is a fully grown "soul."

Whoever infers that "working" or "doing" must produce a "result" (no matter what result) is thinking causally. There is no action without results, since action itself means "producing results," acting being identical with effecting. "Result" means always the "thing done," and causality in its turn means that a "result," viz., the thing done, can only be achieved if it "is" done—which is true but tautological.

Let us suppose that we introduce a hand into a paste. Every move of the hand will leave some mark in that paste, the acting and effecting being the same indivisible motion. The moving of the hand and the making of the mark are the same thing. We segregate, however, some aspects of the "act" as "causes" and some of them as "effects." In speech (even in scientific discourse) we sometimes skip over successive stages of causality, and that is why the identity of subject and cause is not always apparent. The statement "the horse draws the carriage," is undoubtedly causal. It means that the horse is drawing the carriage and the effect will be: the carriage moves on. So the reason why the carriage changes its position is the action of the horse. Nevertheless there is no "succession" involved in that proposition. It does not mean that the horse draws and (afterwards) the carriage moves on. The drawing and the moving are the same thing, the moving is the being drawn. This sort of speech presents really two aspects of the same phenomenon. It is one act. If, on the other hand, a man should say that he is in New Jersey because his mother sent a horse and carriage for him, the mother is referred to as the cause of his displacement; but this turns out to be only a condensation

of a long range of intermediary statements or "causes" actually "omitted" as uninteresting. Mind acts here for reasons of mental economy as a "condenser." The real paradigm of causality, however, is embodied in one single act and in one single statement (*Urteil*). The old question about the origin of universality and certainty as attributes of causal connection would thus be accounted for by the very structure of the statement (sentence) itself and the inner meaning of the verb. Although the "effects" of an action may be manifold, the first effect lies in that very first stage of action and in what changes it accomplishes as action. Effect and action being simultaneous, the first effect of action lies inherently in the action itself. They are both aspects of the same event, they are seen as "action" or as "effect" according to the point of view or, better, from the angle they are looked upon. If the meaning of acting implies effecting as well, then the universality and certainty of the causal nexus would be of tautological origin. Our inability to imagine acting without effecting would account for these characteristics.

Another line of thought might point to a similar result. We "know" that there is no "change" without cause. But does "change" really mean that "somebody" or "something" (that is the cause) must have affected it? Is that "somebody" or that "something" we infer without having "seen" them included in the plain notion of "change"? It seems that change is something impersonal, nonspiritual, independent of an additional "somebody." This is an illusion. "To change" is a transitive verb meaning action. The background of thought behind the verb "change" is the verb "to do," it means "do a change"; it is active and thus it means that whenever something is "done" there must be a "doer" who has done it. But "done" presupposes in itself a doer and so the causal nexus would be reduced to the following: that whenever something is done there must be somebody who has done it. This is quite reasonable. Obviously the "thing done" must have been "done," that is, accomplished by a doer. (I seek the "*activum*" of a given "*passivum.*") But it is likewise tautological.

As a premise to our explanation of causality it is necessary to establish beyond doubt that verbs are causal predicates. Not only such transitive verbs as "to heat" (the stove "heats" the room), all verbs involving some action are causal since there is no action without its counterpart called effect. Even such verbs as "to save" (in "I save money") mean action and hence causation since the seemingly negative meaning of "I save" signifies in reality the exertion comprising the accumulation of money. The verb in the

phrase "I wear shoes" is equally active and causal; it means: I do wear shoes, I am supporting their load. "To read" is transitive (we must read "something"); it is also causal, since it means action which must leave as such some, though not "visible," traces.

If the time factor is apparent in a verb (as in "to kill") there is a clear indication that action is involved. Where this factor is but faintly hinted at, as in all verbs meaning sensory or mental experiences (touch, see, know, etc.), we shall be in doubt whether they really mean action and involve causality. If such a verb is convertible into a meaning designating timeless qualification or classification it can be ruled out as a nonverb (in terms of logic) and hence immaterial for the handling of our problem. Sometimes it may be (logically) both verb and non-verb, for instance: "I know mathematics" may have a connotation of action and be causal; it may, however, mean only: "I am a mathematician" and be a classification. "He sleeps now" may mean that he "takes rest," be causal and connote action or it may mean "he is at rest" and be non-causal descriptive of a status. In German "Ich heisse Johann" looks transitive, but it is only grammatically not logically transitive if it means "My name is John." All verbs (even the intransitive as "to flow" or "to sleep") are, however, modelled after the transitive causal verb; an undertone of action is in every verb; they may all be reduced to "doing," which is their underlying mental background. The whole question loses, therefore, its acuteness.

"Causalism" is a system by virtue of which we conceive events as actions because of the meaning of the verb and the sentence. The mystical and animistic veil of causality presupposes a universe of affinities and power relations and creates the illusion of knowledge about the "nature" and even the "value" of things. Life, however, as a practical proposition would be hardly possible if the mind did not discover a certain uniformity among phenomena, and if it did not exercise selectiveness when establishing the amount of power inherent in different factors. Mind must operate as a "selector" (1) when posing the problem and (2) when "choosing" the "cause." Natural science is non-causal as a result, but causal as an endeavor which will never succeed. The scientist endowed with the causal mind will seek causes and find an enrichment of factual knowledge. The difference between the man of science and the common man is not that between one who knows "causes" and one who doesn't, but that between one having only his eyes and another having in addition a telescope and a microscope, viz., stronger eyes. The techniques of science do not add to any "inner" knowledge, but to the efficiency of senses. A

"causal" science would be mystical. Determinism is animistic; it proceeds after the analogy of acts in dealing with events. It is patterned after the relationship of the doer and the thing done. And because that is so, the system seems to us "rational." But even if it is "rational," it may still have a practical or an objective value.

"Cause" is a simile. When the Greeks adapted the word "aitia" meaning "guilt" as a symbol of "cause," they felt that the "cause" was the thing "guilty" of the event, i.e., the "author." In German *"Ursache"* suggests by means of the prefix *"ur"* the parental relation symbolized in the word "cause." The term *"Grund"* suggests the being "at the bottom" of other things, at the source, from which things spring. The Romance words "causa," "cosa," "chose," "cause," are curiously interrelated. "Cause" means here obviously the very thing, the important thing. The concept is somewhat germane to *"Ursache."* The French conjunction *"car"* meaning "because" is a transformed Latin *"quare"* which in turn means "by virtue of which thing." In Polish "cause" would be *"przyczyna"* (*pshĭchĭna*). Its original meaning is rather "contribution," the word consisting of the prefix *"przy"* and the root *"czyn"* which means simply "action." Thus *"przyczyna"* is "contributory action."

In every given statement (*"Urteil"*) with a verbal predicate (meaning action as a consequence) we may discern two simultaneous mental operations: we analyze and synthetize at the same time. It is a piece of mental engineering. If we say "it thunders," we "twist" or "dissolve" the event (viz., an impersonal "happening") into a subject, an "it," a soul, a source, a doing thing, and the doing itself; but at the same time we link them together, we arrange them into a unity after having spiritualized them. Why? We act after the likeness of our own actions. What for? In order to achieve a befitting fixity of conditions in our mental handling of that phenomenon. It is just as though we should shoot a fluttering bird, stuff it, and put it afterwards into a show case for better observation and handling. Thus we engineer the events, the flowing stream of happenings or changes. It is a most important technical achievement and foreshadows all other feats of technique. It is also their prototype, their preëxisting *eidolon* and it "works" because it is an imitation of "nature," namely, of our own nature or structure. That may explain perhaps why "determinism" or "causalism" are fruitful although animistic.

The conception that there are "parental" relations, that all is a system of acts, is not the result of mere "observation" of "outside" events, but a projection from within. Our "statement," the

sentence, bear witness to that; they are a paradigm of "action" and hence "causality." Man being himself a bundle of "parental" relations, of "acts" emanating from an "author," can not conceive events otherwise than acts emanating from a subject.

The mind of the scientist is "causal," the achievement of science, however, is not cause-finding but fact-finding by means of refined methods of observation or measurement. There is no essential, qualitative difference between the knowledge of the common man and the sublime thinker. It is a question of quantity. In that sense one might maintain that the wisdom of an infant is fundamentally the same as that of Plato and the ethical thinker may discern in such an order of "equality" an instance of Eternal Justice.

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NEW YORK CITY.

BOOK NOTES

Plato's Law of Slavery in its Relation to Greek Law. GLENN R. MORROW. (Illinois Studies in Language and Literature, Vol. XXV, No. 3.) Urbana, Illinois: The University of Illinois Press. 1939. 140 pp. $1.50.

This definitive study is based mainly on the *Laws,* in which the severity of the "Law of Slavery" is contrasted with the humane attitude usually attributed to Plato. Passages relating to capital offenses of slaves "do not make pleasant reading . . . and in this respect Plato's law is a decided anachronism in the fourth century" (p. 126). Professor Morrow makes a detailed comparison with the actual treatment of slaves under Greek law, and the backwardness of Plato's view of slavery becomes unmistakable. The criticism of the enslavement of Greeks (*Republic* V, 469) is shown to be not an attack on the institution as such, but an exception to Plato's general approval of slavery. The statement that a free man should be more reluctant to wrong slaves than to wrong his own equals (*Laws* VI, 777d) does not involve a belief in human equality (as Apelt and Ritter supposed) but implied the contrary. It is not true that Plato accepted the institution of slavery only as a necessary evil. The alleged necessity in the distinction between master and slave "is not to be taken as veiled disapproval, but rather as an assertion that the authority of the master over his slaves is one of the foundations of social order" (p. 131). Plato's law of slavery closely follows his own Athenian law (not, as supposed, the Spartan system), but insisting constantly on a more rigorous discipline in the law, both for master and for slave. He was intent on

the maintenance of authority in view of the peculiar difficulties arising from the dual status of the slave, namely, as a piece of property and as a rudimentary legal person.

D. S. M.

Edmund Husserl's Phenomenology. E. Parl Welch. (University of Southern California Studies, Philosophy Series, Number Four.) Los Angeles: University of Southern California Press. 1939. 100 pp.

The first part of this book expounds fundamental concepts of Husserl's phenomenology such as reduction, essence, intuition, and intentionality. No new examples nor clarifications are presented. A paraphrase of certain sections of the *Ideen* is put forward as Husserl's final philosophy with almost no reference to its development, or later phases.

Far more rewarding is the last half of the book which pits Husserl's analysis against the theories of American realism. The author has made a painstaking effort to collate parallel analyses in systems of thought which are not so much hostile to each other, as alien. He finds very little agreement between them and what he does find is sometimes doubtful. Thus Husserl's realism of the *Untersuchungen* was primarily a logical realism, crusading against crude empiricism, positivism, and pragmatism and his anti-subjectivism is to be interpreted in this light, not in the sense of the realists. It is true, as the author says, that according to both Husserl and the realists "the Ego does not 'create' its objects or its world" but here it should be remembered that Husserl also held as self-evident that it is the Ego's intentional activity which confers upon its objects and its world all their *meaning,* and that existence independent of mind is a "material" impossibility. Unfortunately, the author fails to distinguish clearly between new and critical realism. For example, he attributes to both schools the view, only partly authentic, that "Objects are known, or appear directly, as they are; they are not 'ideas' or fabrications of mind or any mental activity." Had he more clearly separated the two brands of realism he might have seen that Husserl's distinction between immanents and transcendents and his conclusion that objects of sense perception, being transcendent, can not possibly be immanently perceived or known, are absolutely essential to critical realism (Lovejoy, Santayana, and others). This is not to say, of course, that critical realists could accept intuition, *Wesensnotwendigkeit,* and other distinctive features of Husserl's demonstration.

The task the author has set himself is extremely difficult but

important. It is to be hoped that other more extensive efforts will be made to bridge the chasm of disparity and misunderstanding between these two philosophical traditions, realism and phenomenology.

V. J. McG.

Statistical Method from the Viewpoint of Quality Control. WALTER A. SHEWHART. Edited by W. Edwards Deming. Washington: The Graduate School, Department of Agriculture. 1939. ix + 155 pp.

This book is based on four lectures delivered by Dr. Shewhart, member of the Technical Staff of the Bell Telephone Laboratories, at the Graduate School of the U. S. Department of Agriculture. Although it is explicitly concerned with the problems of quality control in mass production, the matters discussed are fundamentally relevant for the logician concerned with the application of abstract theoretical systems to concrete subject-matter; and the careful reader will obtain from it more sound ideas than from a shelfful of ordinary treatises dealing with problems of induction and other questions of scientific method. Dr. Shewhart's detailed conception of the nature and conditions of statistical control is too technical to be reported on in a brief space. But he shows that the task of achieving a homogeneous mass output involves the distinguishable though inseparable acts of specifying the ends to be achieved, of instituting suitable procedures for attaining them, and of judging the quality of the product—acts which closely parallel the familiar steps in scientific inquiry of forming hypotheses, making experiments, and testing theories. It is emphasized throughout the book that statistical methods play a cardinal rôle in the theory and procedure of quality control—as they do in experimental science as well—and that difficult problems must be faced in defining, establishing, and evaluating the limits of variability within which the desired products are to fall. It becomes clear from Dr. Shewhart's exposition that since the meaning of abstract concepts in theoretical statistics is not unique in terms of overt empirical procedures, there is at best only a loose connection between theoretical concepts and overt operations; the former serve as "fountains of suggested operational meanings," and no narrowly conceived operational theory of meaning can do justice to the admitted facts of controlled inquiry. Among other topics of great importance, the book discusses the meaning of "randomness" as specified by statistical control, the "true value" of physical

magnitudes, and the mixture of vague experience and formal criteria which accompany physical measurement.

E. N.

The Prospects of Philosophy. JOHN J. ROLBIECKI. New York: Benziger Brothers, Inc. 1939. xiv + 161 pp. $2.50.

The publishers speak of this as a book suited to teachers and graduate students of philosophy. I do not quite agree. It seems to me much nearer to the undergraduate level, and chiefly valuable there for opening up a great variety of subjects. In this respect it may be stimulating to such a beginner in philosophy. I do not find it offers much to the more mature reader, except in single flashes. But it ranges over the relations of philosophy to mathematics, physics, chemistry, and so on, up to social philosophy and the philosophy of history. The tone is quite religious, but not specifically Catholic.

H. T. C.

OTHER NEW BOOKS AND JOURNALS

Harwood, Sumner: How to Work with People. Scientific Methods of Securing Co-operation. Cambridge, Mass.: Cambridge Analytical Services. 1940. 197 pp. $2.00 direct. $2.50 at book stores.

Ferreira, Carlos vaz: Transcendentalizaciones Matematicas Ilegítimas. Buenos Aires: Instituto de Filosofía, Universidad de Buenos Aires. 1940. 44 pp.

McGill, Nettie Pauline, and Matthews, Ellen Nathalie: The Youth of New York City. New York: The Macmillan Company. 1940. xxvi + 420 pp. $3.50.

LOGOS. Anno XXIII, Fasc. I. Il gusto, il genio e l'arte secondo Kant: *A. Aliotta.* Metafisica e psicologie del Rimorso: *F. M. Bongioanni.* Le ragioni del fenomenismo e dell'Immanenza: *Dante Severgnini.*

ARCHIVIO DI FILOSOFIA. Anno X, Fasc. I. Il ritorno al metodo scientifico nella filosofia contemporanea: *A. Aliotta.* Orientamenti filosofici: *A. Banfi.* Verso un nuovo concetto di realtà: *G. Chiavacci.* Il problema "filosofia" ed i problemi della filosofia d'oggi: *F. M. Sciacca.* Studi sull'Etica di Duns Scoto: *N. Petruzzellis.*

We print below a list of selected articles from the following publications:

REVIEW OF PHILOSOPHY AND RELIGION. Volume Nine, Number One. Alexander's Conception of God: *S. C. Chatterjee.* Rôle of Bhavana in Moral and Spiritual Development: *J. Singh.*

La Critica. Anno XXXVIII, fasc. II. Paralipomeni del libro sulla "storia" (cont.).—VIII. Conoscenza storica e conoscenza tecnica. IX. L'autobiografia come storia e la storia come autobiografia. X. Il giudizio sulla storiografia passata. XI. Il pensiero storico e gli orrori del mondo. XII. L'unità del contingente col necessario: *B. Croce.*

Revue de Théologie et de Philosophie. No. 114–115. De saint Augustin à Pascal. Histoire d'une maxime sur les vertus des philosophes: *Pierre Jaccard.* Philosophie et révélation chez Charles Secrétan: *Philippe Daulte.* Le problème de la transcendance et de la mort dans la philosophie existentielle de Karl Jaspers: *Henri-L. Mieville.* Le groupement additif des relations transitives asymétriques: *Jean Piaget.* Logique et métaphysique: *Maurice Muller.* Pensée reflexive et mystère de l'existence: *Jean de la Harpe.* Orientations fondamentales en métaphysique: *Maurice Gex.* Une expérience socratique: *Léon Brunschvicg.* Valeurs collectives et valeurs universelles: *Marcel Reymond.*

The New Scholasticism. Vol. XIV. No. 3. The Natural Desire for God in St. Thomas: *W. R. O'Connor.* A Case Study in Philosophic Research and Spinoza: *H. A. Wolfson.*

The British Journal of Psychology. Vol. XXXI, Part 1. The General Factor in Aesthetic Judgments: *H. J. Eysenck.*

The Personalist. Summer, 1940. The Nature of Truth and Lord Herbert of Cherbury's Inquiry: *Mario M. Rossi.* Philosophers I Have Known: *J. W. Buckham.* Unified Science and Physicalistic Reductionism: *W. H. Werkmeister.*

Scientia. Vol. LXVII, N. CCCXXXVII–5. Absolute Space and Time: *W. V. Metcalf.* (N. CCCXXXVIII–6.) What is the Philosophy of Science?: *C. K. Davenport.*

La Critica. Anno XXXVIII, fasc. III. Il concetto filosofico della storia della filosofia: *B. Croce.*

Scholastik. XV. Jahrgang, Heft 2. Die Wesensart der Metaphysik des Suarez: *Bernhard Jansen.* Die Autorität in der übernatürlichen und natürlichen Ordnung: *Jakob Gemmel.*

Rivista di Filosofia Neo-Scholastica. Anno. XXXII, Fasc. II–III. Sigieri di Brabante e Dante: *Martino Grabmann.* L'amoralità del diritto di fronte alla dottrina di San Tomaso: *Giuseppe Graneris.* Il problema del fenomenismo razionalistico: *Carmelo Ferro.* Lo spiritualismo di Armando Carlini: *Gustavo Bontadini.* A proposito di alcune correnti dell'idealismo italiana contemporaneo: *S. Vanni Rovighi.*

The Thomist. Vol. II, No. 2. Modern Physics and Thomist Philosophy: *E. F. Caldin.* The Fecundity of Goodness: *Reginald Garrigou-Lagrange.* Problems for Thomists. (I)—The Problem

of Species (Part Five): *M. J. Adler.* (No. 3.) The Common Sense, Perfection of the Order of Pure Sensibility: *Bernard J. Muller-Thym.* The Thomistic Concept of Devotion: *J. W. Curran.*

NOTES AND NEWS

The journal of the Institute of Social Research, formerly called *Zeitschrift für Sozialforschung* and published by Félix Alcan in Paris, from now on will be entitled *Studies in Philosophy and Social Science* and published in the United States, three times a year. The first issue under this new form, numbered Volume VIII (1939) No. 3, has just been published. Each issue will contain about one hundred and sixty pages of articles and reviews.

Editorial communications should be addressed to the Institute of Social Research, 429 West 117th Street, New York City. Max Horkheimer is director, and Frederick Pollock, assistant director. Subscriptions and business communications should be sent to William Salloch, 344 East 17th Street, New York City. The annual subscription price is $3.00 and single numbers sell for $1.00.

The articles in this current issue are as follows: The Social Function of Philosophy: *Max Horkheimer.* Types of Natural Law: *Franz Neumann.* Les origines sociales de l'incrédulité bourgeoise en France: *Bernard Groethuysen.* An Introduction to Hegel's Philosophy: *Herbert Marcuse.* On Kierkegaard's Doctrine of Love: *Theodore W. Adorno.* The Relation between Psychology and Sociology in the Work of Wilhelm Dilthey: *Max Horkheimer.* Criminal Law in National Socialist Germany: *Otto Kirchheimer.*